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AUTHOR	Seagren, Alan T.; And Others
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ABSTRACT

The Instructional Staff Development program (ISD) trains teachers to exhibit behaviors which lead to inquiry skills development in students. Teachers must have an understanding of the total context within which specific strategies function, and they must learn to be responsive to feedback and input from students. The program attempts to help a teacher know what he is doing and how his behaviors could be modified to improve learning. (This paper provides an overview of the ISD program with definitions of terms, expositions of the program's background and philosophy, and descriptions of the individual components or levels of the program.) (Related documents are SP 006 509, 006 411, 006 412, 006 413, 006 415, and 006 416.) (JA)

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Instructional
Staff
Development

OVERVIEW OF THE INSTRUCTIONAL STAFF DEVELOPMENT PROGRAM

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Director
Dr. Alan T. Seagren
Associate Director
Dr. John E. Lux
Principal Author
Dr. Alan T. Seagren
Contributing Authors
Dr. John E. Lux
Lonnie Wood

SP 006 512

The University of Nebraska - Lincoln
and
Mid-continent Regional Educational Laboratory
104 East Independence Avenue, Kansas City, Missouri 64106

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Introduction

This document has been developed to provide an overview of the Instructional Staff Development Program, hereafter referred to as the ISD program. The ISD program is a cooperative research project of the Mid-continent Regional Educational Laboratory and the Teachers College of The University of Nebraska, Lincoln. The project developed prototype training material focusing on teaching behaviors appropriate for inquiry activities in the classroom.

The fully developed ISD program is proposed to include six sequential training units called components. This paper presents a general overview of the ISD program concerning background, philosophy, and rationale. More complete information on each component appears in the training manuals distributed under separate cover.

Purpose of the Program

The purpose of the ISD program is to train teachers to exhibit behaviors which lead to inquiry skill development in students. The program design involves six sequential components moving from an orientation to inquiry to the development of pupil inquiry behaviors. The general goal and a rationale for each component are presented in a latter section on page 2. The specific objectives are specified in the trainer's manual for each component.

General Goals of the ISD Program

The ISD program is based on the idea that certain knowledge, skills, and attitudes are necessary to develop the teacher behaviors required to implement inquiry teaching. As teachers proceed through the six components, the program focuses on achieving the following general goals:

1. Teachers recognize they can control and modify their instructional influence behaviors.
2. Teachers have an understanding and knowledge about the inquiry process.
3. Teachers recognize the importance of various inquiry skills and can use these skills in their teaching.
4. Teachers recognize the various cognitive behaviors of the inquiry process and can use these behaviors in the classroom.
5. Teachers recognize the affective behaviors that are conducive to inquiry and can use these skills and behaviors in the classroom.
6. Teachers recognize the importance of inquiry planning and planning related to both content and process.
7. Teachers recognize the various strategies for inquiry and can use these strategies in the classroom.

Rationale

If one can judiciously assess the movements within education and is aware of the demands being brought to bear upon educators by the public, a likely prediction for the future is that the teacher will play a greater multiplicity of roles than he has in the past. Teachers are faced with the task of inducing social mobility and providing a means for gaining better living conditions and a more satisfying life. Furthermore, they are faced with the demand to aid in

the preservation of the democratic form of government in the United States and at the same time are expected to encourage their students to look at all sides and to inquire into all facets of pertinent issues.

To enable the teacher to respond to the aforementioned demands, he must no longer be primarily a dispenser of information or a trainer in the use of a limited set of skills. Educational technology promises to develop sophisticated instructional systems that will partially replace the dispensing-training functions now delegated to the teacher. It is speculated that programmed instruction and computer assisted instruction will be used to present information and pose questions based on a student's prior knowledge, leading him through a systematic program allowing maximum student gain for time and resources allotted. The typical student in the school of the future will probably receive most of his education by mechanized means at an input-output computer station which will closely approximate the ideal tutor.

The objective of such innovations are to individualize instruction to accommodate different student aptitudes and interests and to increase student participation in the learning process. Under these circumstances the role of the teacher will change to an emphasis on diagnosing pupil strengths and weaknesses, prescribing appropriate instructional tasks, providing individual assistance to enable students to complete tasks, and offering guidance within a warm, interpersonal relationship. Teachers will probably make greater use of small group settings requiring interpersonal skills and understanding of the social behaviors and social processes in group situations. An increasingly significant need in our complex society is for individuals to

participate effectively in groups engaging in problem solving, decision making, and negotiating. It would appear that a major role of the teacher of the future will involve providing educational experiences relevant to group processes.

It would appear the today's students are "role" rather than "goal" oriented. Glasser[1] analyzed this concept in a speech in which he said that students had to find their role before any type of goal orientation was appropriate or meaningful. Teachers, therefore, must design learning experiences from a different point of view than the traditional, goal-oriented motivational techniques, instructional strategies, and means of evaluation currently in vogue.

The role of the teacher is also changing in relation to and interacting with parents in the community. Parents are expecting and even demanding that the professional knows specifically what he is about, how he plans to proceed and how he evaluates what took place.

In summary, the teacher of today and the future should not be primarily an imparter of information. He must be a determiner of educational climate, a learning engineer, and a designer of learning experiences.

The design of teacher preparation in the past probably will not be adequate to prepare the teacher for the new roles he will be expected to perform. It would be indeed fortunate if we could concretely specify the kinds of training experiences necessary to provide teachers with the knowledge, skills, and behaviors appropriate for the new roles that he will play in the future. Unfortunately, the

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[1]William Glasser, "Schools Without Failure," speech given at Phi Delta Kappan breakfast, October 23, 1969, Lincoln, Nebraska.

information is not available to enable final answers to be determined. The modification of teacher education programs needs to evolve on the basis of the best evidence available and to constantly be revised. Hopefully, teacher educators will be able to meet the challenge by providing experiences for teachers which will equip them with the knowledge, skills, and behaviors appropriate for the demands of the future.

Within this broad context the ISD program was conceived. As previously stated, the broad goal of this program is to train teachers to exhibit behaviors which lead to inquiry skill development in students. The focus on inquiry should not be interpreted as meaning that the developers of the ISD program feel that the inquiry process is the only answer to providing meaningful, relevant educational experiences for students. The developers recognize that inquiry teaching is one technique which may or may not be more appropriate in a given setting than others. However, the inquiry process is the primary focus of the program.

The ISD program proceeds from the frame of reference that it is not only important for a teacher to be able to control his behavior in certain specified ways, but it is equally important that the teacher understands and is capable of selecting from a wide range of alternatives the strategy which is most appropriate in terms of the objectives and the type of students with whom he is attempting to communicate and relate. Therefore, this program differs from some skill training programs in that the program attempts to provide a broad base of understanding of teaching skills and behaviors as well as training in specific skills needed to elicit behaviors related to inquiry. The

intent is that teachers must have an understanding of the total context within which specific strategies function, to be more than a technician, and to be responsive to feedback and input from students. Responses must be made in terms of the objectives when making decisions and selecting alternate strategies.

Staff development programs for teachers usually concentrate on the teaching process, on the curriculum to be taught, or both elements. In the ISD program, the emphasis is primarily on the process of teaching with curriculum considerations entering only in Component IV. This is not to suggest that the development of curriculum materials and the study of new content is not important, but it does recognize our belief that individual staff development programs must focus on one major aspect of teaching to be successful. Evidence from the past indicates that curriculum innovations in terms of curriculum are contingent upon the teacher's ability to control and modify behavior so it is congruent with: (1) the intent of the material being utilized, (2) the theory behind these materials, and (3) the activities designed to accomplish the major objectives of the curriculum. The ISD program emphasizes the process of teaching and focuses on influence pattern, inquiry skills, inquiry planning, inquiry strategies, cognitive inquiry behaviors, and affective inquiry behaviors.

The program attempts to help a teacher recognize what he is doing and how his behaviors might be modified to improve learning.

The program recognizes that many teachers have had little or no experiences in inquiry teaching and that their style of teaching is normally expository in nature.[2] This program has been designed to

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[2] Elbert D. Brooks, "The Effect of Alternative Techniques for Modifying Teacher Behavior," Abstract, 1967, p. 13 and Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom, Minneapolis: Paul S. Amidon and Associates, Inc., 1963, p. 44.

assist teachers to modify their instructional behaviors moving step by step from the non-inquiry expository strategies of lecture and recitation into the teacher-directed inquiry strategies of Teacher-Directed Inquiry (TDI) and toward Student Directed Inquiry (TSDI) and then to Pupil Centered Inquiry (PCI).

Teachers are decision makers. They become better decision makers when they are capable of selecting and using the best strategy available to them in accordance with the objectives of the learning experience.

Definition of Terms

For purposes of the ISD program these terms are defined as follows:

1. Inquiry - A set of activities directed towards solving an open number of related problems in which the student has as his principal focus a productive enterprise leading to increased understanding and application.[3]

2. Skills or Behaviors - For the purpose of the ISD project, skills and behaviors are used interchangeably. In examining and analyzing the teaching learning process, a number of activities can be isolated which divide the teaching act into smaller units. A skill or behavior is a component part of the larger Gestalt of the teaching act. Skills or behaviors can be macro or micro in nature. Once the skills or behaviors have been identified they become useful vehicles for analysing and describing the teaching act and provide a focus for practice in attempting to improve the teaching act.

3. Inquiry Skills - For the ISD project, inquiry skills consist of observable dialogue exhibited by teachers and students classified into thirty-four specific categories of the Inquiry Analysis System.[4]

4. Inquiry into Inquiry - A sincere effort has been made in this training program to "practice what we preach." The content of the program consists of a method designed to develop autonomous inquirers, learners who have the understanding and skill to function independently of a tightly controlled learning environment. Consequently, an effort

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[3] Richard M. Bingman, ed., Inquiry Objective in the Teaching of Biology, Kansas City, Missouri: Mid-continent Regional Educational Laboratory, 1969, p. 1.

[4] Alan T. Seagren, et al, Inquiry Skills Component III: Inquiry Behaviors and An Inquiry Discussion Model, Trainer Assessment, Kansas City, Missouri Mid-continent Regional Educational Laboratory, 1969, Appendix A..

has been made to create the same learning conditions for participants in this training program through open active dialogue, and freedom to inquire, explore, and accommodate according to the individual needs and abilities of the participants.

5. Influence - Contacts with the teacher set a pattern of influence that spreads through the classroom; the influence of the teacher, more than any other individual, sets the climate of the class. The teacher controls his own influence primarily by using appropriate statements during spontaneous interaction.[5] For the ISD project, influence is defined as the degree to which a student is dependent or independent upon the teacher to participate in the learning activity as assessed by the directness-indirectness measurement of Inquiry Analysis.

6. Inquiry Strategies - Inquiry strategies are developed by grouping inquiry skills into specific patterns of instruction. The strategies are composed of inquiry dialogue, structural skills, and affective skills which regulate the pattern of behavior that spreads throughout the classroom involving direction and freedom on the parts of the teacher and the students. For the ISD project, groupings of skills or strategies for specific models of inquiry instruction are identified as TDI[6] Teacher Directed Inquiry; TSDI,[7] Toward Student Directed Inquiry; and PCI,[8] Pupil Centered Inquiry.

7. Inquiry Process - Inquiry process is defined as the total act of inquiring. The process includes skills, strategies, phases, and planning which result in inquiry.

8. Cognitive Inquiry Behaviors - Cognitive inquiry behaviors are the specific functions making up the process of inquiry instruction. The ISD project specified ten functions as cognitive inquiry behaviors which are exclusively identifiable in inquiry instruction. These functions concerned: (1) factual data, (2) analyses, interpretation, relationships , (3) hypotheses, (4) process of inquiry into inquiry, (5) feelings and attitude, (6) procedures, (7) sensual observations, (8) identification of goal or problem, (9) assessment of content, goal, or process, (10) non-inquiry behavior.

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[5] Ned A. Flanders, Teacher Influence: Pupil Attitudes and Achievement, U. S. Office of Education Cooperative Research Project No. 397 (Minneapolis: University of Minnesota, 1960) p. 11.

[6] Alan T. Seagren, et al, Inquiry Skills Component III: Inquiry Behavior and An Inquiry Discussion Model, Kansas City, Missouri: Mid-continent Regional Educational Laboratory, 1969, p. 13.

[7] Ibid.

[8] Alan T. Seagren, et al, Pupil Centered Inquiry V, Unpublished work papers for Component V.

9. Affective Inquiry Behaviors - Affective behaviors are feelings, and values which are a part of or promote inquiry. The ISD program has divided these behaviors into the two categories of Openness and Inquiry Orientation.

Openness qualities include: (1) demonstrating the desire to participate freely in inquiry sessions, (2) demonstrating the willingness to subject data and opinions to analysis and criticism by others, and (3) communicating respect for the opinions, feelings, and conclusions of others in the group.

Inquiry Orientation qualities include: (1) communicating understanding of the inquiry process, (2) indicating a preference for statements supported by evidence over unsupported opinion, (3) expressing satisfaction with the inquiry process, and (4) evaluating self and group and using feedback data to improve themselves and the group.

10. Inquiry Planning - Inquiry planning is the preparation which by the teacher or student for inquiry activities. This activity would include selection of: (1) specific model of inquiry, (2) appropriate inquiry dialogue skills, (3) Cognitive inquiry behaviors, and (4) affective behaviors. Selection and implementation of structural and affective behaviors are activities of teacher and student.

11. Behavioral Analysis of Teaching - Behavioral analysis of teaching is the process of analyzing the teaching act by focusing on specific skills or behaviors on the part of the teacher or student. Both subjective and objective types of analysis can be made but the limiting factor is that the behavior must be observable and can be identified.

Philosophy

The philosophy underlying the ISD program is that the training and experiences provided teachers should be within the framework of utilizing the kinds of skills and behaviors which teachers are expected to utilize with students in their classroom. In other words ISD proceeds from the concept of "inquiry into inquiry." As defined earlier, the ISD project involves the development of autonomous inquirers who have the understanding and skill to function indipendently of a tightly controlled learning environment. Through the concept of "inquiry into inquiry," the same learning conditions are created for participants in the training program through open, active dialogue, and freedom to inquire, explore, and accommodate according to their individual needs and abilities.

Smith expanded the concept of inquiry into inquiry as it affects training for teachers. He wrote:

> The behavior changes necessary for teachers to function effectively in the new curricula require a new approach to the preparation of teachers that must of necessity take into consideration the modern conception of knowledge as invented rather than discovered. Teacher educators have an obligation to see that the prospective teacher comes to have an understanding of how and for what purpose our concepts were formulated, how they were validated, and what effect the formulation and validation have on the application of these concepts in an educational setting. This suggests that we attempt to divise and validate an inquiry approach to teacher education.[9]

By design, the trainers "model" the openness of an inquiry situation, recognize the participants as decision-makers, and provide data in response to questions and problems. This philosophy presents certain kinds of problems in the development of training materials since the types of experiences, materials utilized, and the alternatives cannot be limited. The trainer must select from alternative the strategy which seems most appropriate on the basis of feedback from participants in the training program. The training utilizes the process of active inquiry. It is assumed that comprehension of the nature and uses of the acquired knowledge will be increased; furthermore, the development of skills in applying this knowledge will be reinforced.

What is Inquiry Teaching?

The terms "inquiry" and "inquiry teaching" are defined in a variety of ways. A close analysis of these definitions, however, reveals several significant principles which can be identified and used to structure an instructional program to promote inquiry teaching. The analysis of these definitions of inquiry will help to identify several significant principles. For the purpose of the ISD program, inquiry is defined as "a set of activities directed towards solving

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[9]Richard B. Smith, "The Implications of Inquiry Structures for the Teacher Education Curriculum," The Journal of Teacher Education XXX (Fall, 1968) p. 343.

an open number of related problems in which the student has as his principal focus a productive enterprise leading to increased understanding and application."[10]

Another definition of inquiry which contributes to the overall understanding of the central focus was offered by Suchman. He defines inquiry as "an attitude toward learning and a philosophy of education. The central values are the open mind and the autonomous probing of the learner."[11]

In K-12 Social Studies for Nebraska Schools, inquiry is defined as "simply a process or way of learning. It is a method by which teacher and student alike can judge and evaluate information in order to arrive at some conclusion concerning issues."[12] In this cotext, inquiry is the application of a person's intelligence in a systematic manner to information that is deemed important providing those skills by which reasoning can be directed towards ideas.

Smith cited "inquiry" and "inquiry teaching" as basic issues in curricular reform when he recognized there "has been the notion that the learning of a discipline means learning the inquiry structure of that discipline. The concept of inquiry structure involves a new concept of knowledge that has vast implication for teacher education both in terms of the way teachers are taught and the way they teach.[13]

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[10]Richard M. Bingman, ed., Inquiry Objectives in the Teaching of Biology, Kansas City, Missouri: Mid-continent Regional Educational Laboratory, 1969, p. 1.

[11]J. Richard Suchman, "Learning Through Inquiry," Childhood Education, 41:6 (February, 1965), p. 290.

[12]Nebraska State Department of Education. K-12 Social Studies for Nebraska Schools, 1968. p. 12.

[13]Smith, Richard B., "The Implications of Inquiry Structure for the Teacher Education Curriculum," The Journal of Teacher Education, XXX (Fall, 1968), p. 343.

In summary, we may say that inquiry is the application of certain steps of thought in the assessment of knowledge.

Instructional Principles Related to Inquiry Teaching

From these similar definition of inquiry, a number of instructional principles may be drawn:

1. Inquiry is a process. Along with the subject matter, inquiry process must be studies and used if the learner is to have a total education. Once the process is understood and accepted as one of the most promising "means" to learning, it can be used in both class and out-of-class situations.

2. Learning requires the active involvement of the learner. Inquiry implies the active participation of the learner, as shown by the statements from the definitions such as "the autonomous probing of the learner," "a set of activities," and "teacher and pupil alike can judge."

3. The learning process called inquiry has definite cognitive behaviors or parts. These cognitive behaviors can be identified, analyzed, and developed in classroom and non-classroom experiences. Inquiry into inquiry is essential to inquiry teaching.

4. The inquiry process includes a number of important skills. These skills can be identified, analyzed, and developed to promote learning. Both teachers and students need to utilize these skills.

5. The inquiry process includes affective behaviors. These behaviors can be identified, analyzed, and developed in teachers and students alike, thus becoming integral parts of the "attitude toward learning and a philosophy of education." These feelings are identified by inference from overt behavior.

6. Inquiry seeks decisions based on the rational analysis of data. The words "open mind," increased understanding and application," and "application of a person's intelligence in a systematic manner" found in these definitions make clear the responsibility of both teacher and students to the analysis of data and the application of this process to the solving of problems.

7. Inquiry teaching means modeling the inquiry process. An inquiry teacher must understand inquiry and must create "a set of activities which promotes inquiry. Teacher behaviors influence student behaviors, and the "autonomous probing of the learner" takes place much more readily when the teacher recognizes this process.

Assumptions Related to the ISD Program

The ISD program is based on the following assumptions:

1. Teacher behavior can be modified and changed.

Flanders, in 1962, made several assumptions that were basic to teacher behavior. These included that only a teacher can change his own behavior; that changes can occur in teaching methods; that no one pattern of teaching can be adopted universally by all teachers; and that the most effective environment for change allows for freedom of people to express their feelings and ideas, encourages self-direction and is free of coercion.[14]

Amidon and Flanders summarized the results of a number of studies involving modification of behavior:

> Student teachers who had been taught interaction analysis differed significantly from those who had been exposed to traditional teacher education programs.[15]
>
> Teaching is a specific form, or set of forms, of habitualized human behavior. It is observable, measurable, analyzable, differentiatable, and modifiable.[16]
>
> Only the teacher can make changes in his classroom behavior. Others may help in the process of change, but they cannot do so unless the teacher himself desires a change. The desire to understand and improve one's own behavior is. . .the major prerequisite of behavior change.[17]

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[14] Ned A. Flanders, "Using Interaction Analysis in the Inservice Training of Teachers", Journal of Experimental Education, 30: 313-6, 1962.

[15] Amidon and Flanders, op. cit., The Role of the Teacher in the Classroom, 1967, p. 90.

[16] Gale W. Rose, "Performance Evaluation and Growth in Teaching", Phi Delta Kappan XLV (October 1963), p. 49.

[17] Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom, revised edition, (Minneapolis, Minnesota: Associations for Productive Teaching, Inc., 1967) p. 2.

2. Behavioral analysis of teaching is both desirable and necessary for any change of teacher behavior.

> The teacher. . .is continually exerting influence on the children and on the learning situation. . . By studying his own behavior in some systematic objective manner, the teacher may gain further insight into his own pattern of influence. As he gains insight into his behavior, he may decide. . .that he wants to change his behavior because either he is not achieving what he thought he was achieving, or he is not achieving what he has decided he wants to achieve on the basis of new insights about how children learn.[18]

> When one says that teaching is a set of habits, one is also implying that such behavior is most immutable. Habits can be changed. Though they can become remarkably resistant to alteration, teaching styles are not necessarily fixed for all time. Almost everyone who has worked as a teacher or with teachers over a long enough time has been able to see his own and other styles undergo some change usually very gradually but sometimes with startling suddenness.

> All too often efforts to bring about change in deeply ingrained habits are rather naive and superficial in approach. The teacher concerned seldom has seen what his present habits are clearly and in enough detail that he can begin to grapple realistically with them. And the alternative styles to which he might move are discussed in vague and fuzzy language. It would be my contention that the specific analysis of teaching habits provides the most adequate and efficient basis for intelligent change.[19]

3. Teachers are concerned about their behaviors and the influence which they have on students in the classroom and they are interested in improving their performance (behavior) through a process of self analysis.

> Teachers have never had an empirically verified theory to serve as a basis for their classroom behavior. Yet, perceptive teachers have sensed that the quality and quantity of teacher-pupil interaction is a critical dimension of effective classroom teaching.[20]

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[18] Amidon and Flanders, op. cit., pp. 1-2.

[19] Rose, op. cit., p. 50.

[20] Edmund J. Amidon and John B. Hough, Interaction Analysis: Theory, Research, and Application (Reading, Mass.: Addison-Wesley Publishing Company, 1967), p. 2.

> Without a way of objectively describing the nature of classroom interaction, teachers in the past have had no way of capturing the elusive phenomenon of their instructional behavior, the climate that it creates in their classroom, and the effect of this climate on student attitudes and achievement.[21]

> Apparently teachers have a great interest in and need for objective information about their own patterns of influence, how these patterns match their intentions, and whether the differences they expected from different patterns did or did not occur.[22]

4. Providing teachers with information about their teaching performance in the form of feedback is important if teachers are to modify and change their behaviors.

> The communication of data about the effect of a person's behavior on others back to that person is termed feedback. It is an essential aid to the teacher who is trying to understand and improve his classroom behavior. Programs organized for helping teachers to understand their behavior and to plan behavior change must have provision for an effective feedback system.[23]

5. Teachers can be assisted by supervisors in the process of analysis and assessment if the supervisor focuses on specific kinds of teaching behaviors.

> . . .the best function of the so-called "supervisor by teachers would be precisely the function of providing complete, accurate feedback of the teacher-pupil situation and the supplying of a range of alternatives to unsuccessful procedures. Perhaps it is rather silly to urge teachers to "improve" until they know quite specifically what it is that is not working and what other ways of working are available.[24]

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[21] Amidon and Hough, op. cit., p. 2.

[22] Ned A. Flanders, Teacher Influences, Pupil Attitudes, and Achievement, U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Monograph No. 12, 1965, p. 44.

[23] Amidon and Flanders, op. cit., p. 4.

[24] Gale W. Rose, "Performance Evaluation and Growth in Teaching", Phi Delta Kappan XLV (October 1963), p. 52.

6. Teachers must have a broad understanding of the instructional process in order to select the alternative which is most appropriate on the basis of objectives and students.

> Where several alternative patterns of behavior on the part of the teacher are likely to be equally successful in producing the desired learning condition, then that one which is most easily generated in teachers should be specified in the method.[25]

> By analyzing their classroom behavior and reflecting on alternate approaches to teaching specific lessons, this could possibly lead the teacher to higher level objectives, methods, and expressions that would maximize the potential for stressing more cultural values in approved ways, teaching could become more effective. Thus, teachers could become more efficient at carrying out the socialization process in the classroom.[26]

Design of Instruction

One of the difficulties in staff development programs in the past has been that they have focused on providing only information or instruction to teachers. Too often little or no consideration has been given to assisting teachers in practicing new skills, implementing these skills in the classroom and assessing the effectiveness of the alternatives selected. The design of instruction for each of the components of this program proceeds from five basic and sequential steps illustrated in Figure I.

Step 1. Sensitization - (an awareness of specific behaviors or skills). In this particular part of instruction the emphasis is on making teachers aware that there are many alternatives or strategies which might be employed in any given teaching-learning situation and on making them aware of the

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[25] Norman E. Wallen and Robert M. W. Travers, "Analysis and Investigation of Teaching Methods", Handbook of Research on Teaching, Ed. N. L. Gage, (Chicago: Rand McNally and Company, 1963), p. 485.

[26] Wayne Roberson, "The Preparation of an Instrument for the Analysis of Teacher Classroom Behavior", (unpublished dissertation, University of Arizona, 1967), p. 68.

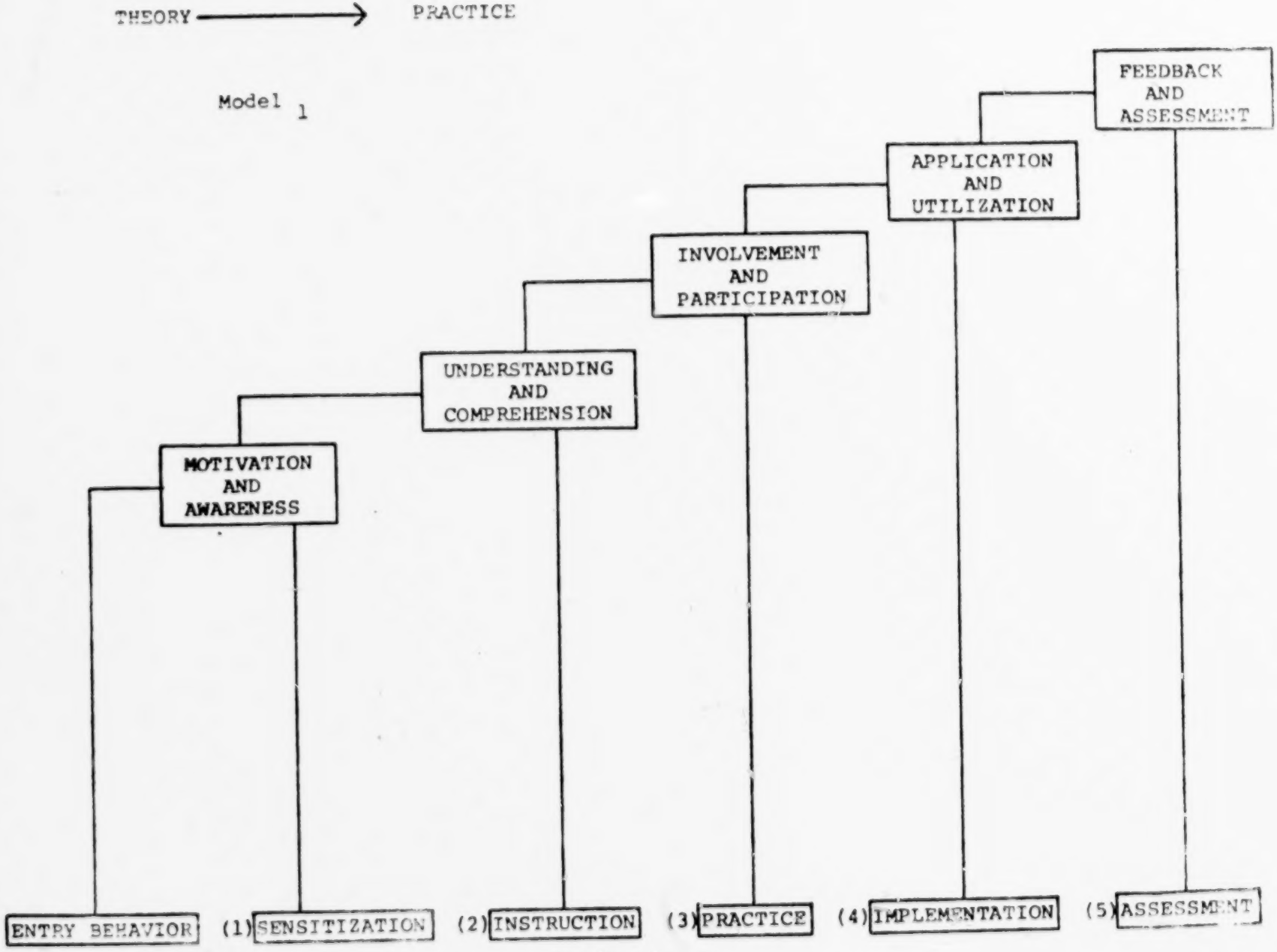

FIGURE 1
Instructional Design

kinds of behaviors and skills which might be appropriate within these strategies. The intent here is for motivation to stimulate and expand their thinking.

Step 2. Instruction - (knowledge and understanding of specific skills or behaviors). In this phase of instruction the emphasis is on the particular skills or behaviors which have been identified as being appropriate for that component. This is the most structured part of the design. However, even in this part, actual examples of teachers who are participating in the program are used as indicators of progress and of levels of readiness. It has been found that using actual classroom videotapes or practice tapes of the participants in the instructional part of the program has enhanced acceptance of the instructional program. Videotapes also enable the level of readiness to be identified and instruction can begin from that point.

Step 3. Practice - (the opportunity to try to control selected behaviors or skills). The recognition of the importance of practicing specific skills and behaviors has always existed. Too often this dimension has been ignored and we have assumed that teachers can implement new skills and behaviors in the classroom after they have received instruction. When attempts are made to change or modify behavior, the results are not always successful and frustration may result. The importance of practice in the preparation of teachers was brought out by the studies by Allen and associates concerning the Microteaching Technique at Stanford University.[27] In this program the intent was that participants would have an opportunity to practice the skills or behaviors for which they had received instruction in controlled

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[27]Dwight Allen and Kevin Ryan, Microteaching, (Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.), 1969.

or ideal situations. In most ISD components microteaching is conducted with small groups of students, and it is done in the school where the teacher is functioning. This is an important dimension of the instructional design. Many of the components contain a debriefing session following the practice sessions. In the debriefing session the emphasis is on the ability of teachers to perform, to raise questions, and to seek clarification about the instruction which they have previously received.

Step 4. Implementation - The focus here is putting into operation the skill or behavior in the normal classroom setting situation. In the practice session the focus was only on the particular behavior or skill being studied or analyzed. This phase is based on the assumption that if teachers have successfully mastered the skill or behavior in practice, they should be able to incorporate this specific behavior or skill within their total repertoire of skills and behaviors. This step also is related to the ability of teachers to select the alternative which might be most appropriate within a given situation.

Step 5. Assessment - Two types. (1) How effective was the alternative (skill or behavior) selected in accomplishing the intended goals? (2) How effective was the teacher in controlling his behavior or utilizing the skills? Greater elaboration is provided in the Evaluation section, but in the assessment part of the design consideration must be given to the setting in which the teaching episode took place. Some determination must be made as to the effectiveness of the alternative selected. This determination is often made by the participants. Sometimes the trainer being aware of the circumstances and situation of the teaching episode may think that another alternative may have been more appropriate. Therefore, the participants must have a

major impact on this. Part two of the assessment concerns the ability of teachers to stay within model ranges.

Components of the Program

There are many strategies for organizing and structuring educational programs. Systems analysis, currently used in business, defense, and aerospace industries and found to be an effective organizational technique, appears to be applicable for planning and controlling purposes in the field of education as well. The lattice technique has been chosen as the organizational strategy for this program because of its appropriateness to the instructional requirements. Basic to the lattice technique is the breaking down of the curriculum into its component parts and elements and organizing these components and elements into logical systematic sequences. The sequencing of the components in this program begins with the simple kinds of skills and behaviors and proceeds to those which are more complex. The program also proceeds from the teacher-centered classroom to the situation where a pupil may be independently involved in inquiry situations. The typical teacher today is likely to be in front of a classroom of thirty students where he is in charge. To change or modify this behavior, the program begins from the point where most teachers presently are; and it attempts to provide teachers with the understanding and skills necessary to change and modify their behavior to promote pupil-centered learning.

Component I - Orientation to Inquiry

Goal - A general orientation to the instructional strategy of inquiry.

Component I was designed to be an initial effort to develop a common understanding among teachers of the concept of inquiry and to provide an

overview of the entire project. Attention was focused on (1) attempting to develop a common conceptualization of the terms of inquiry and (2) the ability of participants to identify classroom discussion episodes as inquiry or noninquiry on the basis of their present understanding.

Manuals have been prepared for trainers and for participating teachers with the assumption that trainers will have participated in a workshop to prepare them to use the materials in the way they were intended. The Workshop Sessions manual[28] provides the trainer with a detailed outline of specific procedures for each session of Component I on pages 1 to 12. The objectives, goals, rationale, special trainer instructions, and assessment instructions are provided for Component I in the Trainer's Manual,[29] pages 1 to 14. Materials which each of the participating teachers use in Component I are found in the Handout Materials manual,[30] pages 1 to 12.

Component II - Inquiry Influence

Goal - To develop within teachers interaction analysis interpretation skills and an awareness of influence patterns.

The intent of this component was to enable teachers to better understand the impact of verbal behavior on students. The objective was to have participants gradually structure the verbal influence pattern to move students from teacher-directed, student-dependent inquiry to increasing the student's independence of teacher direction. Practice was given to

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[28] Alan T. Seagren et. al. Instructional Staff Development: Workshop Sessions, (Kansas City, Mo.: Mid-continent Regional Educational Laboratory), 1971.

[29] Alan T. Seagren et. al. Instructional Staff Development: Trainer's Manual, (Kansas City, Mo.: Mid-continent Regional Educational Laboratory), 1971.

[30] Alan T. Seagren et. al. Instructional Staff Development: Handout Materials, (Kansas City, Mo.: Mid-continent Regional Educational Laboratory), 1971.

participants in controlling their influence behavior. Another major goal of this component was to make teachers aware that they can control their influence behavior in predetermined ways. The primary focus of instruction was the ten basic categories from Flanders' Interaction Analysis System. The study of Flanders' Interaction Analysis System per se does not necessarily facilitate inquiry. In terms of the sequence of the program it is a necessary step to provide a basis for further components and to provide teachers with experiences in interpreting and modifying specific dimensions of their behavior.

An outline of specific procedures used in each of the instructional sessions for Component II is found in the Workshop Sessions manual, pages 13 to 44. Objectives, goals, rationale, special instructions for trainers, and assessment instructions are provided for Component II in the Trainer's Manual, pages 15 to 33. Materials which each of the participating teachers use in Component II are in the Handout Materials manual, pages 14 to 46.

Component III - Inquiry Skills

Goal - To develop within teachers inquiry skills which promote the development of inquiry skills in pupils.

Emphasis in this component focused on the Inquiry Analysis System. The Inquiry Analysis System consists of an expansion of the ten basic categories of Flanders' Interaction Analysis into thirty-four subcategories which focus on specific inquiry behaviors. Participants were also introduced to cognitive or structuring inquiry skills and affective inquiry behaviors. The primary emphasis in Component III was an expansion of the influence dimension to the inquiry teaching skills.

An outline of specific procedures for Component III are in the Workshop Sessions manual, pages 45 to 77. Objectives, goals, rationale, special trainers' instructions, and assessment instructions are in the Trainer's Manual, pages 34 to 51. Participants' materials are in the Handout Materials manual, pages 45 to 88.

Component IV - Behavioral Objectives

Goal - To develop within teachers skills in analyzing and formulating inquiry behavior objectives.

This component is designed to transfer the teachers' attention from acquiring specific teaching skills to applying these skills within a framework of planning for inquiry in the classroom. In general, it was designed to help the teachers recognize how instructional objectives are related to teaching skills and how to incorporate instructional objectives in their planning and teaching. Practice was provided to gain experience in planning and utilizing inquiry teaching style in both microteaching and classroom situations.

Component IV procedures are outlined in the Workshop Sessions manual, pages 78 to 112. Objectives, goals, rationale, special instructions for trainers, and assessment instructions are in the Trainer's Manual, pages 52 to 70. Materials for the participants are in the Handout Materials manual, pages 88 to 107.

Component V - Pupil-Centered Inquiry

Goal - The goal here is to develop within teachers behaviors which promote pupil-centered inquiry.

Emphasis in this component focused on both teacher and pupil behaviors which exemplify pupil-centered inquiry. Skills, inquiry phases, and affective behaviors were identified, analyzed, and practiced by both teachers and pupils. Both small and large group inquiry were analyzed and practiced, giving participants experience with new inquiry settings. Effective teacher-pupil decision making was stressed, preparing both teachers and pupils for more self-directed inquiry.

Procedures for Component V are outlined in the Workshop Sessions manual, pages 113 to 140. Objectives, goals, rationale, specific instructions for trainers, and assessment instructions are in the Trainer's Manual, pages 70 to 80. Participants' materials are in the Handout Materials manual, pages 108 to 127.

Component VI - Affective Behaviors Which Promote Inquiry

Goals - To develop within pupils affective behavior which are supportive of and necessary to logical inquiry.

This component is designed to shift focus from teacher behaviors that promote inquiry to those affective behaviors which need to be developed in students for effective inquiry. Students are moved toward positions of responsibility which allows them to be more independent of the teacher and to function in a cooperative role in a climate of relative autonomy. Pupils become more independent of the teacher at certain critical decision-making points.

Component VI has all procedures, objectives, goals, rationale, special instructions for trainers, and assessment instructions as well as handout materials in one manual titled, Component VI - Affective Behaviors Which Promote Inquiry: Trainer's Manual.[31]

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[31] Alan T. Seagren et. al. Component VI - Affective Behaviors Which Promote Inquiry: Trainer's Manual, (Kansas City, Missouri: Mid-continent Regional Educational Laboratory), 1971.

Models

To assist teachers in analyzing their own behavior and selecting appropriate alternatives, models of teaching behaviors have been developed. These models were not developed with the intent that they be emulated by the teacher or superimposed upon the teacher. They are intended to be utilized as guidelines by teachers in assisting them in selecting the alternatives and assessing the outcomes. Inquiry teaching and learning take a variety of forms varying according to the amount of freedom given to the learner to make decisions on the content and the process to be followed. The various teaching and learning forms are called inquiry strategies. In this project four distinct inquiry strategies have been conceptualized and developed into models. These models have been used as a part of the instructional packages in the various components. They provide a theoretical framework on which to base the instruction which focused on influence, skills, and behavioral objectives. As indicated in the design of the components, these also proceed from simple to complex in terms of the prerequisite skills and behaviors on the part of teachers. Each of the models is specified in terms of ranges of percentages and behavioral keys which are derived from the ten basic categories of Flanders' Interaction Analysis and the subcategories of the Inquiry Analysis System.

1. TDI - Teacher-Directed Inquiry

This strategy is teacher and question centered with teacher leading the learners to desired discussions and decisions. Students inquire into the concepts or problems designated by the teacher and in the designated process (leading questions prepared by the teacher and asked in a logical sequence).

2. TSDI - Toward Student-Directed Inquiry

This strategy is still teacher directed, but it encourages more student ideas initiated by the learners themselves. It is more idea centered than question centered and more pupil centered than teacher centered. The teacher utilizes more indirect influence behaviors to encourage the students to inquire freely. Opportunities for students to make decisions as to content (after content goals have been identified by the teacher) are available in this strategy. The teacher still directs the process of inquiry; but again, the students have more freedom to make decisions as to next steps and process evaluation.

3. PCI - Pupil-Centered Inquiry

This strategy is student centered. The learners have much freedom under the direction of the teacher to determine both content and process. It may be class inquiry, group inquiry, or individual inquiry. The teacher assumes the role of the prober, organizer, and facilitator rather than the role of information giver. Once a concept or problem is attempted by the learners, either from their own decision or from the suggestions of the teacher, they proceed to determine the data available, the hypothesis to investigate, the validity of the data, the determination of conclusions, and the assessment and application of conclusions reached.

These models are specified in terms of behaviors and skills which are congruent with the instruction received in the components of the program.

Training

For purposes of training, the following have been identified:

T_1's - Specialists at the University of Nebraska-Lincoln who have participated in the development of these materials and who are competent to train trainers.

T_2's - Trainers who have gone through the program components and who have received special training in use of the materials. They will be competent to intervene, make adaptations and select alternatives within the programs for specific needs and requirements of the school district and for individual teachers.

T_3's - Classroom teachers for whom the training in these components was designed.

It is fundamental to the utilization of this staff development program that trainers (T_2's) who desire to work with classroom teachers (T_3's) will receive training from the individuals who developed the program (T_1's).

Evaluation

Four types of evaluation data are collected in the ISD program.

1. Teacher and Student Classroom Performance data are collected using three verbal behavior observational instruments:

   a. The Inquiry Analysis System (IAS) is a modification of Flanders' Interaction Analysis which codes thirty-four subcategories of behaviors. This instrument is used with Components I to IV. This provides data on where each participant is in relation to the Inquiry Models since they are described in terms of some of these categories.

   b. The Revised Inquiry Analysis System (Revised IAS) is a three-column simultaneous coding of teacher verbal behaviors, student verbal behaviors, and cognitive inquiry behaviors. It is used in conjunction with Component V. The PCI model is expressed in terms of these categories of behaviors.

c. The Affective Behavior Checklist is a system which codes seventeen verbally expressed affective inquiry behaviors. These are specific behaviors which are categorized as "openness" or "inquiry orientation". This instrument is used with Component VI.

2. Written Pre-Posttests on each component are as follows:

a. Component I Pre-Posttest involves the identification of ten audiotaped classroom episodes as examples of either inquiry or non-inquiry. It is used to indicate changes in the participant's perceptions of what constitutes an inquiry session.

b. Component II Pre-Posttest provides six items which give information on the degree to which each participant can interpret interaction analysis coding. The pretest may be used to determine the level of comprehension of IA before instruction so sessions may be modified accordingly. The posttest results will enable the trainer to determine the success of instruction in this component.

c. Component III Pre-Posttest is an essay question which asks the participant to describe teaching behaviors utilized in student-centered inquiry discussion. The number and specificity of behaviors mentioned provide an index to the participant's concepts of this type of inquiry.

d. Component IV Pre-Posttest provides the trainer with information on the ability of each participant to (1) identify behavioral Objectives, (2) write behavioral objectives, (3) classify according to the Taxonomy[32], and (4) plan in terms of these factors. The

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[32]Benjamin S. Bloom, ed. Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, (New York: David McKay Company, Inc.), 1956.

pretest may be used to determine appropriate instruction in this component and to determine effectiveness of instruction.

e. Component V Pre-Posttest is in two parts. The first part consists of four written items on the definition of PCI, teacher and student behaviors appropriate for PCI, and interpretation of coding from the Revised IAS instrument. In the second part, participants are asked to identify PCI episodes from five videotaped sessions. Concepts of the PCI strategy are reflected by this instrument.

f. Component VI Pre-Posttest includes ten videotaped episodes from which participants are asked to identify affective behaviors. The trainer can determine to which affective inquiry behaviors each participant is sensitive and which ones need additional work.

3. Participant opinionnaires are used in each component to determine the teacher's attitudes and feelings about the strengths and weaknesses of instruction and to get recommendations for changes. This also provides the participant with a reason to review the component's activities and to put them in perspective.

4. Pupil attitudes are determined in two ways: student questionnaires are given at the end of Component V and of Component VI. After participation in small group activities, students are orally interviewed on their feelings about the session.

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